STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

May 2018

Log No. _____

1. State Building Code to be Amended:

- ☐ International Building Code
- ☐ ICC ANSI A117.1 Accessibility Code
- ☐ International Existing Building Code
- X International Residential Code
- ☐ International Fire Code
- ☐ Uniform Plumbing Code
- ☐ International Mechanical Code
- ☐ International Fuel Gas Code
- ☐ NFPA 54 National Fuel Gas Code
- ☐ NFPA 58 Liquefied Petroleum Gas Code
- ☐ Wildland Urban Interface Code

For the Washington State Energy Code, please see specialized energy code forms

Section(s):
R403.6

Title:
Increased Range Hood Ventilation

2. Proponent Name (Specific local government, organization or individual):

Proponent: Mark Vossler
Title: President, Washington State Physicians for Social Responsibility
Date: 4/8/22

3. Designated Contact Person:

Name: Mark Vossler
Title: President, Washington State Physicians for Social Responsibility
Address: 2524 16th Ave S. #300, Seattle, WA 98144

Office Phone: (425) 894-8794
Cell: ( )
E-Mail address: mark@wpsr.or

4. **Proposed Code Amendment**. Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code, additional pages may be attached.

   Clearly state if the proposal modifies an existing amendment or if a new amendment is needed. If the proposal modifies an **existing amendment**, show the modifications to the existing amendment by underlining all added language and striking through all deleted language. If a new amendment is needed, show the modifications to the **model code** by underlining all added language and striking through all deleted language.

   Code(s) Residential **Section(s)** M1505.4.4

   Enforceable code language must be used.
   Amend section to read as follows:

TABLE M1505.4.4(1)

MINIMUM LOCAL EXHAUST RATES

Area to be exhausted	Exhaust Rate	
	Intermittent	Continuous
Kitchens	~~100 cfm~~ See Table M1505.4.4.3.2	30 cfm
Bathrooms - Toilet rooms	50 cfm	20 cfm

M1505.4.4.3 Demand-Controlled Mechanical Exhaust for Kitchen Range Hoods. A local mechanical exhaust system for kitchen range hoods shall be designed to be operated as needed.

M1505.4.4.3.1 Kitchen Range Hood Control and Operation. Demand-controlled mechanical exhaust systems shall be provided with at least one of the following controls:

1. A readily accessible occupant-controlled ON-OFF control
2. An automatic control that does not impede occupant ON control

M1505.4.4.3.2 Kitchen Range Hood Ventilation Rate and Capture Efficiency. Ventilation systems for kitchen range hoods shall meet or exceed either the minimum airflow or the minimum capture efficiency in accordance with Table M1505.4.4.3.2 Capture efficiency ratings shall be determined in accordance with ASTM E3087.

TABLE M1505.4.4.3.2

KITCHEN RANGE HOOD AIRFLOW RATES (CFM) AND ASTM E3087 CAPTURE EFFICIENCY (CE) RATINGS ACCORDING TO DWELLING UNIT FLOOR AREA AND KITCHEN RANGE FUEL TYPE

Dwelling Unit Floor Area (ft^2)	Hood Over Electric Range	Hood Over Natural Gas Range
>1500	50% CE or 110 cfm	70% CE or 180 cfm
>1000 - 1500	50% CE or 110 cfm	80% CE or 250 cfm
750 - 1000	55% CE or 130 cfm	85% CE or 280 cfm
<750	65% CE or 160 cfm	85% CE or 280 cfm

M1505.4.4.3.3 Sound Ratings for Kitchen Range Hoods. Kitchen range hoods shall be rated for sound at a maximum of 3 sones at one or more airflow settings no less than 100 cfm at a static pressure determined at working speed as specified in HVI 916 section 7.2.

M1505.4.4.3.4 Field Verification and Diagnostic Testing. Vented range hoods installed to comply with local mechanical exhaust requirements specified in M1505.4.4.3 shall be field verified in accordance with the procedures below to confirm the model is rated by HVI or AHAM to comply with the following requirements:

1. Range hood ventilation systems shall be tested, balanced and verified to provide a minimum airflow rate or capture efficiency required by M1505.4.4.3. Testing shall include verification of the maximum sound rating as specified in M1505.4.4.3. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring device at the range hood. Where required by the building official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the building official.
2. The verification shall utilize certified rating data from the HVI Publication 911: Certified Home Ventilating Products Directory or another directory of certified product performance ratings approved by the State Building Codes Council for determining compliance. The verification procedure shall consist of visual inspection of the installed kitchen range hood to verify and record the following information:

   3.1 The manufacturer name and model number.

   3.2 The model is listed in the HVI Directory.

   3.3 The rated airflow value listed in the HVI directory.

   3.4 The sound rating value listed in the HVI directory.

3.5 If the value for the rated airflow given in the directory is greater than or equal to the airflow requirements specified in M1505.4.4.3.2, and if the value for the sone rating given in the directory is less than or equal to the sone rating requirements specified in Standards, then the kitchen range hood complies, otherwise the kitchen range hood does not comply.

Add reference to Chapter 15

AHAM

Association of Home Appliance Manufacturers
1111 19th St NW
#402
Washington, DC, 20036

Standard reference number	Title	Referenced in code section number
HRH-2	Household Range Hoods	M1505.4.4.3.4

Add reference to Chapter 15, under ASTM:

E3087—18: Standard Test Method for Measuring Capture Efficiency of Domestic Range Hoods, M1505.4.4.3.2, Table M1505.4.4.3.2

Add reference to Chapter 15, under ASHRAE:

ASHRAE 62.2 - 2019: Ventilation and Acceptable Indoor Air Quality in Residential Buildings, M1505.4.4.3.3

Add reference to Chapter 44, under HVI:

HVI Publication 911: Certified Home Ventilating Products Directory, M1505.4.4.3.4

5. **Briefly explain your proposed amendment, including the purpose, benefits and problems addressed.** Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

Add differentiated ventilation requirements of hood ranges based on fuel type to reduce personal exposure and health impacts from ranges. These requirements are based on research done by Lawrence Berkeley National Laboratory where they found that dwellings are currently not adequately ventilating their stoves, which can increase the risk of asthma for children living in these dwellings.

5. **Specify what criteria this proposal meets.** You may select more than one.
   X The amendment is needed to address a critical life/safety need.
   ☐ The amendment clarifies the intent or application of the code.

☐ The amendment is needed to address a specific state policy or statute.
☐ The amendment is needed for consistency with state or federal regulations.
☐ The amendment is needed to address a unique character of the state.
☐ The amendment corrects errors and omissions.

6. Is there an economic impact: X Yes ☐ No

If no, state reason:

If yes, provide economic impact, costs and benefits as noted below in items a – f.

a. ***Life Cycle Cost.*** Use the OFM Life Cycle Cost **Analysis tool** to estimate the life cycle cost of the proposal using one or more typical examples. Reference these **Instructions;** use these **Inputs.** Webinars on the tool can be found **Here** and **Here**). If the tool is used, submit a copy of the excel file with your proposal submission. If preferred, you may submit an alternate life cycle cost analysis.

Operational cost difference should be negligible between a compliant range hood and a non-compliant range hood.[1]

b. ***Construction Cost.*** Provide your best estimate of the construction cost (or cost savings) of your code change proposal.

Minimum Airflow Requirement	Dwelling Unit Square Footage	Microwave-Range Hood Incremental Cost*	Microwave-Range Hood Incremental Cost/sq ft*	Under Cabinet Incremental Cost*	Under Cabinet Incremental Cost/sq ft*
250 cfm	1,000 ft^2	$206	$0.21/sq ft	$415	$0.42/sq ft
280 cfm	750 ft^2	$267	$0.36/sq ft	$379	$0.51/sq ft
280 cfm	500 ft^2	$267	$0.53/sq ft	$379	$0.76/sq ft

*Incremental compared to 180 cfm requirement, which 92% of products already meet[2]

c. ***Code Enforcement.*** List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

This should have no impact on small businesses because it is targeted to Group R occupancies.

d. ***Small Business Impact.*** Describe economic impacts to small businesses:

This should have no impact on small businesses because it is targeted to Group R occupancies.

e. ***Housing Affordability.*** Describe economic impacts on housing affordability:

This should have a small impact on housing affordability.

[1] https://title24stakeholders.com/wp-content/uploads/2020/10/MF-IAQ_Final-CASE-Report_Statewide-CASE-Team_Final.pdf, page 115-117
[2] https://efiling.energy.ca.gov/getdocument.aspx?tn=236201, page 9 - 15

f. ***Other.*** Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Exposure to poorly ventilated gas stove pollutants, such as nitrogen dioxide (NO_2), can increase the risk of asthma in household occupants, particularly children.[3] The Environmental Protection Agency (EPA) states that homes with a gas stove have 50-400% higher average NO_2 levels than homes with an electric stove.[4] The EPA found that even short-term exposure to NO_2 is linked to asthma and other chronic respiratory illnesses.[5] In addition to respiratory effects NO_2 exposure has been linked to diabetes, cardiovascular disease, and birth outcomes.[6] This risk of exposure to NO_2 can be lowered when high-performing externally vented range hoods are installed and used to decrease concentrations of NO_2 and other pollutants released from gas combustion.[7] These findings could translate to a significant health and economic benefit from the regulation of gas stove combustion.

Per person costs of asthma in one California study were estimated to be $3,288 annually.[8] This estimate included costs of medications as well as office and emergency room visits. Assuming similar health costs for Washington, we could see a significant economic and medical benefit for the 9% of residents affected by asthma and other respiratory illnesses if exposure to gas stove pollution is reduced.[9]

Please send your completed proposal to: sbcc@des.wa.gov

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.

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[3] Kathleen Belanger et al, "Household levels of nitrogen dioxide and pediatric asthma severity", Epidemiology 24(2), March 2013, https://www.ncbi.nlm.nih.gov/pmc/articles/ PMC3686297/.

[4] *Integrated Science Assessment For Oxides Of Nitrogen – Health Criteria* (Final Report, July 2008), US Environmental Protection Agency, Washington, DC, EPA/600/R-08/071, 2008,p. 2–38, https://cfpub.epa.gov/ncea/isa/ recordisplay.cfm?deid=194645.

[5] Integrated Science Assessment (ISA) For Oxides of Nitrogen – Health Criteria (Final Report, 2016). US Environmental Protection Agency, Washington, DC, EPA/600/R-15/068, 2016, p.1-31, https://cfpub.epa.gov/ncea/isa/recordisplay.

[6] Ibid, p. 1-32, 1-33, 1-34, 1-35

[7] Brett Singer et al., Effective Kitchen Ventilation for Healthy Zero Net Energy Homes with Natural Gas, 2021, Lawrence Berkeley National Laboratory, prepared for the California Energy Commission, https://eta.lbl.gov/publications/effective-kitchen-ventilation-healthy

[8] American Thoracic Society. 2018. "Asthma costs the US economy more than $80 billion per year." ScienceDaily. January 12. Accessed November 22, 2020. https://www.sciencedaily.com/releases/2018/01/180112091212.htm *and* https://efiling.energy.ca.gov/getdocument.aspx?tn=236201, page 15

[9] Most Recent Asthma State or Territory Data. March 24. Accessed November 22, 2020. https://www.cdc.gov/asthma/most_recent_data_states.htm